Curriculum Planner

(Department of Botany, Kalindi College)

Course : **B. Sc. Life Science**

Semester : **I (NEP)**

Paper : **Plant Diversity and Systematics (BOT- DSC-1) : Practicals**

Name of the Teacher : Dr. M. Arunjit Singh

1. Viruses: EM of TMV and Bacteriophage, Specimens of virus infected plants (any two). **(Week: 01)**	September 2024
2. Bacteria: EM of a bacterium, types through permanent slides/photographs, specimens of infected plants (any two). **(Week: 01)**	September 2024
3. Algae: Study of vegetative and reproductive structures of (a) *Nostoc* (b) *Volvox* (c) *Spirogyra* through temporary preparations and permanent slides. **(Week: 01)**	September 2024
4. Fungi: Study of vegetative and reproductive structures of (a) *Rhizopus*, (b) *Penicillium*, and (c) *Agaricus* through temporary preparations and permanent slides/specimens/photographs. **(Week: 01)**	September 2024
5. Lichens: Crustose, Foliose and Fruticose (specimens/photographs). **(Week: 01)**	October 2024
6. Bryophytes: Study of (a) *Marchantia* morphology of thallus, W.M. rhizoids and scales, V.S. thallus through gemma cup, W.M. gemmae (all temporary slides), V.S. antheridiophore, archegoniophore, L.S. sporophyte (all permanent slides),	October 2024
(b) *Funaria*: detailed study and classification from W.M. rhizoids, operculum, peristome, spores and permanent slides of archegonia, antheridia and capsule. **(Weeks: 02)**	October 2024 October 2024
7. Pteridophytes: Study of *Pteris:* T. S. of Rachis, V.S. of Sporophyll and W.M. of sporangium. **(Week: 01)**	November 2024
8. Gymnosperms: Study of *Pinus* morphology of long & dwarf shoot, male and female cones (specimens) and T.S. of needle (permanent slides only). **(Week: 01)**	November 2024
9. Herbarium technique (Mounting of a properly dried and pressed specimen of any wild plant on the herbarium sheet with complete herbarium label). **(Week: 01)**	September 2024 October 2024
10. Taxonomic study of characters of 1 plant from each of the following families (any four): **Malvaceae, Solanaceae, Asteraceae, Fabaceace, and Liliaceae. (Weeks: 05)**	

Suggested/ Essential Readings

1. Campbell, N.A., Reece,J.B. (2008) Biology, 8th edition, Pearson Benjamin Cummings, San Francisco.
2. Evert, R. F., Eichhorn,S.E. (2012).Raven Biology of Plants, 8th edition, New York, NY: W.H.Freeman and Company.
3. Bhatnagar, S.P., Moitra, A. (1996).Gymnosperms. New Delhi, Delhi, New Age International (P) Ltd. Publishers..

Curriculum Planner

(Department of Botany, Kalindi College)

Course : **B. Sc. (H) Botany**
Semester : **III (NEP)**
Paper : **Phycology: The Algae World BOT-DSC-7 : Theory**
Name of the Teacher : Dr. M. Arunjit Singh

Unit 1: Introduction to Algal World 6 hours Relevance of studying algae – Industrial (food, feed, fodder), Environmental (climate change, biofuel, acidification of oceans), Evolutionary (range of thallus organization); General characteristics; Ecology, diversity and distribution; Range of thallus organization; Cell structure; Criteria for classification (cell wall, pigment system, reserve food, flagella); Reproduction and life cycle patterns; Classification by Fritsch; Evolutionary classification of Lee (only up to groups); Significant contributions of eminent Phycologists.	September 2024
Unit 2: Cyanophyceae (Blue-Green Algae) 3 hours General characteristics; Occurrence; Cell structure; Heterocyst (structure and function); Morphology, reproduction and life-cycle of Nostoc, economic importance.	October 2024
Unit 3: Chlorophyceae (Green Algae) 6 hours General characteristics; Occurrence; Cell structure; Morphology, reproduction and life-cycle of Chlamydomonas, Volvox, Chlorella, Ulva, Oedogonium, Coleochaete; Chara; Structure and evolutionary significance of Prochloron, economic importance.	October 2024
Unit 4: Xanthophyceae (Yellow-Green Algae) 2 hours General characteristics; Occurrence; Morphology, reproduction, and life-cycle of Vaucheria, economic importance.	October 2024
Unit 5: Bacillariophyceae (Diatoms) and Dinophyceae (Dinoflagellates) 3 hours General characteristics, Occurrence, morphology, unique features, economic importance.	November 2024
Unit 6: Phaeophyceae (Brown Algae) 4 hours General characteristics; Occurrence; Morphology, reproduction, and life-cycle of Ectocarpus and Sargassum, economic importance.	November 2024
Unit 7: Rhodophyceae (Red Algae) 4 hours General characteristics; Occurrence; Morphology, reproduction, and life-cycle of Gracilaria, economic importance. Unit 8: Recent advances in algal studies 2 hours Model systems and their applications in genetic, molecular and evolutionary studies.	November 2024
Suggested Readings: 1. Bold, H.C. and Wynne, M.J. (1985). Introduction to the Algae: Structure and Reproduction, 2nd edition. Prentice-Hall International INC. 2. Kumar, H.D. (1999). Introductory Phycology, 2nd edition. Affiliated East-West Press, New Delhi. 3. Lee, R.E. (2018). Phycology, 4th edition: Cambridge University Press, Cambridge. 4. Sahoo, D. and Seckbach, J. (2015). The Algae World. Springer, Dordrecht. 5. Sahoo, D. (2000).Farming the Ocean: Seaweed Cultivation and Utilization. Aravali Book International, New Delhi.	

Curriculum Planner

(Department of Botany, Kalindi College)

Course : **B. Sc. (H) Botany**
Semester : **III (NEP)**
Paper : **Phycology: The Algae World BOT-DSC-7 : Practical**
Name of the Teacher : Dr. M. Arunjit Singh

1. Study of algal diversity in different habitats through botanical excursion and submission of digital catalogue/report of various species observed.	September 2024
2. Nostoc: Study of vegetative, reproductive structures from temporary mounts and permanent slides; Ultrastructure of Heterocyst through Electron Micrographs.	September 2024
3. Chlorella: Study of vegetative, reproductive structures from temporary mounts. Study of ultrastructure through Electron Micrographs.	September 2024
4. Volvox: Study of vegetative, reproductive structures from temporary mounts and permanent slides.	September 2024
5. Oedogonium: Study of vegetative, reproductive structures from temporary mounts and permanent slides.	October 2024
6. Coleochaete: Study of vegetative, reproductive structures from temporary mounts and permanent slides.	October 2024
7. Chara: Study of vegetative, reproductive structures from temporary mounts, specimens and permanent slides.	October 2024
8. Vaucheria: Study of vegetative, reproductive structures from temporary mounts and permanent slides.	November 2024
9. Diatoms and Dinoflagellates: Study vegetative, reproductive structures of at least two taxa from water bodies.	November 2024
10. Ectocarpus: Study of vegetative, reproductive structures from temporary mounts and permanent slides.	November 2024
11. Sargassum: Study of vegetative, reproductive structures from temporary mounts, specimens and permanent slides.	November 2024
	November 2024

12. Polysiphonia/ Gracilaria: Study of vegetative, reproductive structures from temporary mounts and permanent slides.	
Suggested Readings: 1. Bold, H.C. and Wynne, M.J. (1985). Introduction to the Algae: Structure and Reproduction, 2nd edition. Prentice-Hall International INC. 2. Kumar, H.D. (1999). Introductory Phycology, 2nd edition. Affiliated East-West Press, New Delhi. 3. Lee, R.E. (2018). Phycology, 4th edition: Cambridge University Press, Cambridge. 4. Sahoo, D. and Seckbach, J. (2015). The Algae World. Springer, Dordrecht. 5. Sahoo, D. (2000).Farming the Ocean: Seaweed Cultivation and Utilization. Aravali Book International, New Delhi.	

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(Department of Botany, Kalindi College)

Course : **B. Sc. (H) Botany**
Semester : **V (NEP)**
Paper : Plant Pathology BOT-DSE-05 **: Practical**
Name of the Teacher : Dr. M. Arunjit Singh

Practicals	
1. Study of Late blight of Potato through specimens, temporary mounts (V.S. of leaf showing infection) and permanent slides.	September 2024
2. Study of Black stem Rust of Wheat: Symptoms on wheat and barberry. Observe uredospores and teleutospores on V.S. wheat leaf/ to study stem spore stages of Puccinia graministritici with the help of temporary tease/section mount of wheat. Permanent slides of somatic and reproductive phases on both the hosts.	September 2024
3. Study of smut of barley, symptoms of loose and covered smut and temporary spore mount.	September 2024
4. Study of Powdery mildew of pea, Symptoms with the help of live or preserved specimens. Study of Erysiphe asexual and sexual stages with the help of temporary tease/section mount/ permanent slides.	September 2024
8. Study of symptoms of Red rot of sugarcane, W.M. of conidia through temporary tease mount.	October 2024
9. Study symptoms of bacterial diseases: Citrus canker, Angular leaf spot of Cotton.	October 2024
10. Study symptoms of viral diseases: Tobacco mosaic Disease, Vein clearing of Abelmoschus esculentus/Ageratum sp.	October 2024
11. Study of nematode diseases: Root knot disease of Brinjal.	November 2024
12. Isolation of seed borne mycoflora by moist chamber method technique.	November 2024
13. Study of biocontrol agents: Nematophagous fungi; Trichoderma sp.	
14. The students should submit specimens of any two plant diseases studied by them.	

Suggested Readings: 7. Agrios, G.N. (2005) Plant Pathology 5 th edition: Elsevier Academic Press, Amesterdam. 8. Sharma, P.D. (2014) Plant Pathology Rastogi Publications, Meerut, U.P. 9. Singh, R.S. (2018) Plant Diseases. 10th Edition Medtech, New Delhi. Additional Readings: ● Ownley, Bonnie and Trigiano, Robert N. (2017). Plant Pathology: Concepts and Laboratory Exercises, 3rd Edition, CRC Press.	